

1 Claims:

2 1. A carriage drive system, comprising:

3 a variable speed drive motor for propelling a movable  
4 carriage; and

5 a mechanism for switching between a gear ratio  
6 resulting in a high carriage speed and a gear ratio  
7 resulting in a low carriage speed wherein the mechanism for  
8 switching between the gear ratio resulting in a high  
9 carriage speed and the gear ratio resulting in a low  
10 carriage speed is actuated automatically.

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12 2. A carriage drive system according to claim 1, wherein  
13 the mechanism for switching between the gear ratios is a  
14 centrifugal clutch.

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16 3. A carriage drive system according to claim 1, wherein  
17 the gearing mechanism is a planetary gear assembly having:

18 a sun gear driven by the drive motor;

19 a ring gear; and

20 a plurality of planet gears associated with a planet  
21 carrier.

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23 4. A carriage drive system according to claim 3, wherein  
24 operation of the drive motor at a high speed causes the  
25 mechanism for switching between gear ratios to engage the  
26 ring gear causing the planet gears and the drive gear to be  
27 locked together such that they rotate as one with the sun  
28 gear resulting in a 1:1 gear ratio and operation of the  
29 drive motor at a low speed causes the mechanism for  
30 switching between gear ratios to disengage the ring gear

1 causing the sun gear to turn the planet gears which turn the  
2 ring gear resulting in a gear ratio greater than 1:1.

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4 5. A carriage drive system according to claim 3, further  
5 comprising a speed calibration member for adjusting the gear  
6 ratio between the drive motor and the ring gear.

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8 6. A carriage drive system according to claim 5, wherein  
9 the gear ratio between the drive motor and the ring gear is  
10 proportional to a friction force between the planet carrier  
11 and the speed calibration member.

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13 7. A printer, comprising:

14 a movable carriage supporting print heads having an ink  
15 ejecting nozzle;

16 a slide rod for supporting and guiding the movable  
17 carriage;

18 a variable speed drive motor for propelling the movable  
19 carriage along the slide rod;

20 a gearing mechanism having a gear ratio resulting in a  
21 high carriage speed and a gear ratio resulting in a low  
22 carriage speed; and

23 a mechanism for switching between the gear ratios  
24 wherein the mechanism for switching between the gear ratios  
25 is actuated automatically.

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27 8. A printer according to claim 7, wherein the mechanism  
28 for switching between the gear ratios is a centrifugal  
29 clutch.

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1 9. A printer according to claim 7, wherein the gearing  
2 mechanism is a planetary gear assembly having:

- 3 a sun gear driven by the drive motor;
- 4 a ring gear; and
- 5 a plurality of planet gears associated with a planet  
6 carrier.

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8 10. A printer according to claim 9, wherein operation of  
9 the drive motor at a high speed causes the mechanism for  
10 switching between gear ratios to engage the ring gear  
11 causing the planet gears and the drive gear to be locked  
12 together such that they rotate as one with the sun gear  
13 resulting in a 1:1 gear ratio and operation of the drive  
14 motor at a low speed causes the mechanism for switching  
15 between gear ratios to disengage the ring gear causing the  
16 sun gear to turn the planet gears which turn the ring gear  
17 resulting in a gear ratio greater than 1:1.

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19 11. A printer according to claim 9, further comprising a  
20 speed calibration member for adjusting the gear ratio  
21 between the drive motor and the ring gear.

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23 12. A printer according to claim 11, wherein the gear ratio  
24 between the drive motor and the ring gear is proportional to  
25 a friction force between the planet carrier and the speed  
26 calibration member.

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28 13. A printer according to claim 12, wherein the speed  
29 calibration member is manually adjustable.

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1 14. A method for printing, comprising:  
2 activating a variable speed drive motor to propel a  
3 movable carriage;  
4 switching between a gear ratio resulting in a high  
5 carriage speed and a gear ratio resulting in a low carriage  
6 speed;  
7 wherein switching between the gear ratio resulting in a  
8 high carriage speed and the gear ratio resulting in a low  
9 carriage speed occurs automatically by means actuated by the  
10 operational speed of the drive motor.  
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